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THE MAIN COLLECTION OF RECENT MOLLUSCS IN THE CROATIAN NATURAL HISTORY MUSEUM*

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The main collection of recent molluscs in the Croatian Natural History Museum (CNHM) in Zagreb is the most extensive collection of malacofauna specimens in the Zoology Department of CNHM. It was begun in the middle of the nineteenth century and has been progressively extended ever since. It comprises some 120,000 shells of land snails and freshwater molluscs. Most of the items on display were collected in Croatia, with a smaller number from other areas of what used to be Yugoslavia. The value of the collection inheres in the large number of endemic specimens, especially of the Clausiliidae family, and in its type specimens. For this reason the collection represents an invaluable source for taxonomic research and biological diversity. Unfortunately, like the other collections of recent malacofauna in the CNHM, the main collection has been afflicted by Byne's disease. This is why it is essential to secure adequate accommodation and protection for it in order to ensure its survival for future generations.

Key words: mollusc collection, natural history museum, Byne's disease, Croatia.

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Opća zbirka recentnih mekušaca Hrvatskoga prirodoslovnog muzeja u Zagrebu (HPM) najveća je malakološka zbirka njegova Zoološkog odjela. Nastala je polovicom 19. stoljeća i otada se stalno nadopunjava. Sadrži preko 120000 ljuštura kopnenih i slatkovodnih puževa te slatkovodnih školjkaša. Glavnina materijala skupljena je na području Hrvatske, a manji dio na drugim područjima bivše Jugoslavije. Vrijednost zbirke je u velikom broju endemičnih vrsta, naročito iz porodice Clausiliidae, te u tipskim primjercima. Zbog toga predstavlja vrijedan izvor za taksonomske obrade i istraživanja biodiverziteta. Nažalost, kao i ostale zbirke recentne malakofaune u HPM-u,

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i opća zbirka napadnuta je Byneovom bolešću. Zbog toga joj je neophodno osigurati adekvatan smještaj i zaštitu kako bi se sačuvala za budućnost.

Ključne riječi: zbirka mekušaca, prirodoslovni muzej, Byneova bolest, Hrvatska

INTRODUCTION

The mollusc collections of the Croatian Natural History Museum in Zagreb number about 600,000 specimens and represent, together with the entomological collections, the Museum's best stocked zoological section. Those specimens that have been dealt with professionally (identified, listed and catalogued) have hitherto been held in 5 separate collections: The Spiridion Brusina collection of recent molluscs, the Ljudevit Rossi collection, the collection of foreign molluscs, the cephalopod collection, and the main collection of recent molluscs.

The main collection of the Croatian Natural History Museum (CNHM) numbers about 120,000 land and freshwater molluscs, mainly from Croatia, rather fewer from adjoining republics. The collection was begun in the middle of last century and was based on the work of Spiridion Brusina (1845–1908). Following his death, work on molluscs remained moribund for some 70 years, and the collection was extended only during the last 20 years. Thus we may divide the collection chronologically into: a) the older section (until 1977); and b) the new section (1977 until the present day). The present work deals with the older section of the collection, numbering 94,027 specimens under 4,815 catalogue entries. The older section of collection contains 387 species and subspecies of land and freshwater snails in the form of their shells.

FEATURES OF THE COLLECTION

1. Representation of size classes

We have divided snail shells into three classes according to size:

1. small – shells up to and including 5 mm;
2. medium – shells larger than 5 mm but 10 mm or less;
3. large – shells larger than 10 mm.

The percentage of the larger classes was calculated in relation to the total number of taxa (species and subspecies), in relation to the total number of catalogue entries, or else in relation to the total number of specimens (Tab. 1, Fig. 1). The results showed that large species predominate. This is a consequence of collecting individual specimens in the field. With this method of collection only those specimens which are instantly noticed are gathered, i. e. those of large or medium dimensions. Collection through soil samples yields small species as well, but many collectors and mollusc experts during the 19th and the beginning of the 20th century did not use this mode of collection.

Table 1. The percentage of classes by shell size in relation: a) to the total number of taxa; b) to the total number of catalogue entries; c) to the total number of specimens in the collection.

shell size	number of taxa (%)	number of catalogue entries (%)	number of specimens (%)
large (> 10 mm)	68	83	76
medium (> 5 mm; ≤ 10 mm)	19	13	14
small (≤ 5 mm)	13	4	10

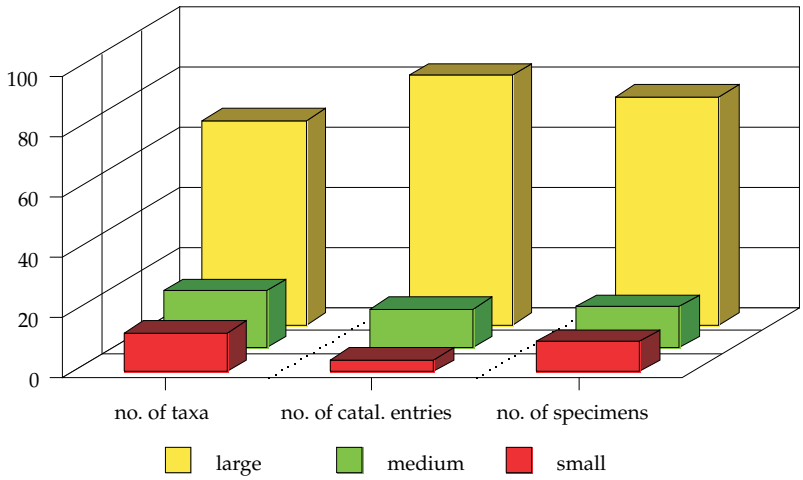

Fig. 1. The percentage of classes by shell size in relation: a) to the total number of taxa; b) to the total number of catalogue entries; c) to the total number of specimens in the collection.

2. Representation of systematic groups

The percentage of families in the collection (classification of families according to KERNEY *et al.* 1983) was calculated in relation to the number of taxa, in relation to the total number of catalogue entries and in relation to the number of specimens (Tab. 2, Fig. 2). The highest frequencies occurred in the Clausiliidae and Helicidae families, which is a consequence of the large and easily visible shells of these families. Both families feature in many endemic species in the eastern Adriatic and Dinaric area (e. g. species of the genus *Campylaea* s.l., *Delima*, *Medora*, *Agathylla*, *Herilla*, *Dilataria* etc.). As such they featured in the collecting programme of numerous malacologists. The Zonitidae family represented the third highest

frequency. Other families make up 23% of the catalogue entries, or 33% of all the specimens in the collection.

Table 2. The percentage of mollusc families in relation: a) to the total number of taxa; b) to the total number of catalogue entries; c) to the total number of specimens in the collection.

mollusc families	number of taxa (%)	number of catalogue entries (%)	number of specimens (%)
Zonitidae	6	7	4
Helicidae	23	35	16
Clausiliidae	43	35	47
others	28	23	33

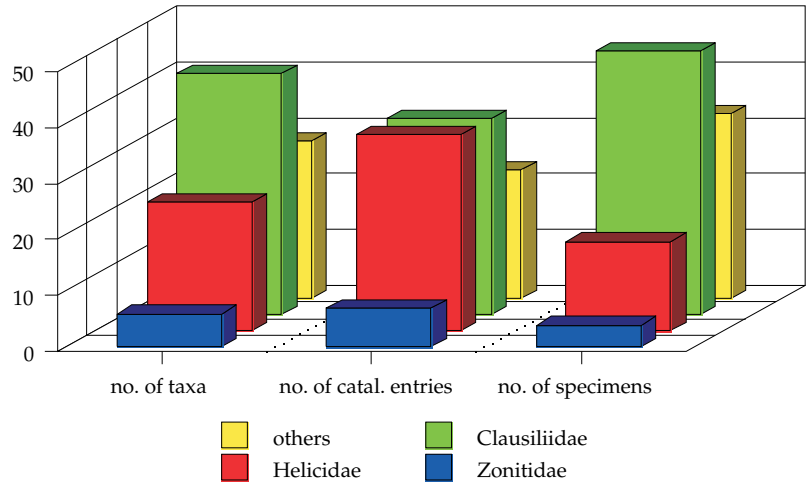

Fig. 2. The percentage of families in relation: a) to the total number of taxa; b) to the total number of catalogue entries; c) to the total number of specimens in the collection.

3. Representation of zoogeographic elements

Among the species and subspecies in the collection we identified the following zoogeographic elements:

1. widely scattered (comprising Holarctic, Palaearctic, European species)
2. Dinaric species

3. Alpine species
4. Endemic (species or subspecies whose range is wholly or for the most part on the territory of Croatia)
5. Mediterranean
6. other (comprising Carpathian, Balkanic, Pontic species)

The percentage representation of taxa, of catalogue items, or else of specimens (Tab. 3, Fig. 3) relating to individual zoogeographic elements indicates that mainly endemic elements predominate. The collection's wealth of endemic species constitutes its value and interest in malacological terms.

Table 3. The percentage of : a) taxa; b) catalogue entries; c) specimens relating to individual zoogeographic elements in the collection.

zoogeographic element	number of taxa (%)	number of catalogue entries (%)	number of specimens (%)
Endemic	39	27	33
Widely scattered	20	31	29
Dinaric	9	13	11
Alpine	12	14	11
Mediterranean	8	13	12
Others	12	2	3

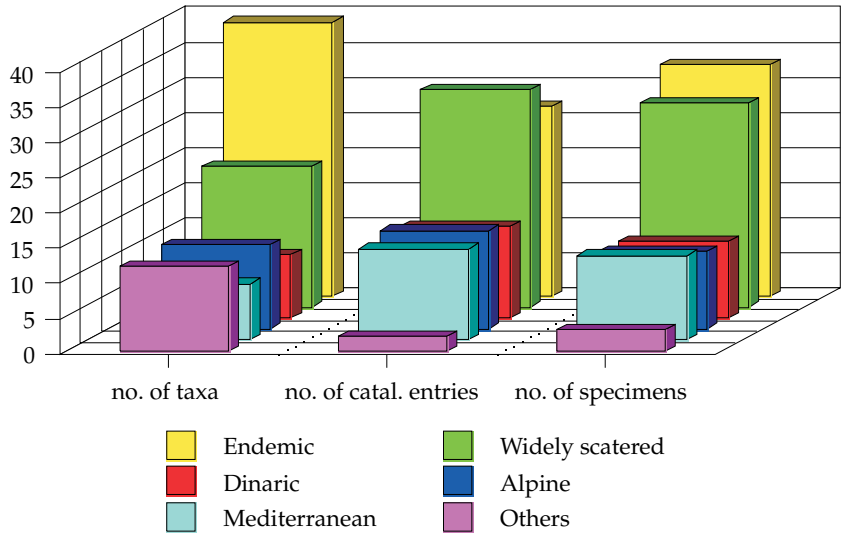

Fig. 3. The percentage of: a) taxa; b) catalogue entries; c) specimens relating to individual zoogeographic elements in the collection.

4. Representation of land and freshwater molluscs

About 90% of molluscs in the collection relate to surface land snails. Subterranean land snails make up only 0.03% of specimens, or 0.1% catalogue entries, or 1% of taxa. Snails living in fresh water constitute only a small part of the collection (Tab. 4, Fig. 4). Once the existing stock in the Museum has been processed, the percentage of freshwater species is likely to increase significantly.

Table 4. The percentage of surface land snails, subterranean land snails and freshwater snails in relation: a) to the total number of taxa; b) to the total number of catalogue entries; c) to the total number of specimens in the collection.

	number of taxa (%)	number of catalogue entries (%)	number of specimens (%)
surface land snails	88.86	90.27	86.59
freshwater snails	10.10	9.62	13.38
subterranean land snails	1.04	0.10	0.03

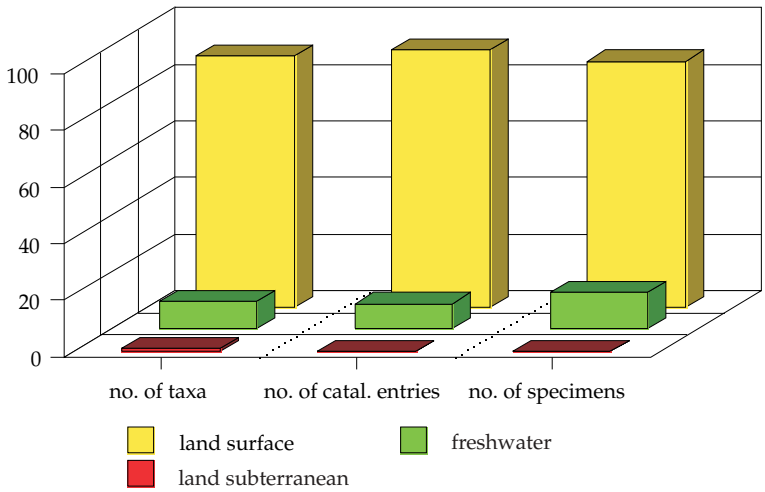

Fig. 4. The percentage of surface land snails, subterranean land snails and freshwater snails in relation to: a) the total number of taxa; b) the total number of catalogue entries; c) the total number of specimens in the collection.

5. Data on the place and time of collection

Localities are occasionally identified in terms that are too broad (so that we cannot identify the precise site of taxa), or conversely, too precise, so that we cannot locate them with the aid of the maps and literature available to us. Nevertheless, most of the locations quoted in the collection can be processed and they

form an invaluable source of data on the distribution of species, although it is a pity that the locality of collection is only rarely accompanied by the date. This deficiency may be remedied in cases where details of the collector are known to exist. Thanks to knowledge of the collector, which is fairly frequently available to us, and knowing the period of the collector's life, we are in position to determine the approximate date of the relevant information.

6. Types contained in the collection

Types identified to date in the older section of the collection include:*

1. Holotype: *Campylaea lucescens* Brusina, 1876;
2. Lectotypes: *Campylaea setigera albina* Brusina, 1869; *C. setigera globulosa* Brusina, 1869; *C. insolida costulata* Brusina, 1869; *C. setosa pilosa* Brusina, 1869; *C. imberbis* Brusina, 1876;
3. Paralectotypes: *Campylaea insolida costulata* Brusina, 1869; *C. setigera globulosa* Brusina, 1869; *C. setosa pilosa* Brusina, 1869; *Campylaea imberbis* Brusina, 1876.

The new section of the collection include:

1. Holotypes: *Truncatellina lussinensis* Štamol, 1995; *T.velkovrhi* Štamol, 1995
2. Paratypes: *Truncatellina lussinensis* Štamol, 1995; *T. velkovrhi* Štamol, 1995
3. Topotypes: *Truncatellina lussinensis* Štamol, 1995.

The number of types is certainly greater but this cannot be confirmed until the entire collection has been scientifically analysed.

7. Condition of the collection

The condition of the collections of recent malacofauna in CNHM has been discussed hitherto on a number of occasions (MEDAKOVIĆ *et al.*, 1990; ŠTAMOL, MEDAKOVIĆ, 1990; MEDAKOVIĆ, ŠTAMOL, 1992; ŠTAMOL, MEDAKOVIĆ, 1993). The main collection of recent malacofauna is unfortunately in no better position: it, too, is housed inadequately in a display section, in wooden cases and tubes of common window-glass, exposed to dust, a wide range of temperatures, and – worst of all – infected by »Byne's disease«.

REQUIREMENTS

The first thing the collection needs is adequate housing in a more or less constant temperature and in conditions of low humidity, in metal cases and tubes of quartz glass.

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* The genus *Campylaea* types design. P. Subai. The revision of the *Helicigona* subgenus *liburnica* has been finished and will be published in **Archiv für Molluskenkunde**, Frankfurt am Main.

What the collection needs is an expert review of its older holdings (identification, listing and cataloguing), and recording (listing and cataloguing) of its recent acquisitions. Specification by UTM map references or UTM grid of 10×10 sq. km for the identification of localities would facilitate our knowledge of the relevant range of taxa.

All this calls for financial resources which our society has not granted hitherto.

CONCLUSION

The main collection of recent molluscs in the Croatian Natural History Museum in Zagreb comprises some 120,000 land and freshwater molluscs. To date 94,027 specimens have been processed (identified, listed and catalogued) under 4,815 catalogue numbers (entries), which contains 387 species and subspecies of land and freshwater snails in the form of their shells. The greater part of the collection is formed by endemic species, mostly from the Clausiliidae and Helicidae families. The collection also contains a number of types (holotypes, paratypes, topotypes, lectotypes, paralectotypes), although their exact number has not been ascertained. Given the size and range of its holdings, the collection constitutes a major source for the classification and study of fauna. Unfortunately, the collection is inadequately accommodated and subject to attack by »Byne's disease«. To date, society has been unable to find the financial resources to solve these problems.

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SAŽETAK

Opća zbirka recentnih mekušaca Hrvatskog prirodoslovnog muzeja

V. Štamol

Zbirke mekušaca Zoološkog odjela Hrvatskoga prirodoslovnog Muzeja (HPM) u Zagrebu broje oko 600000 primjeraka i predstavljaju, uz entomološke, najbogatije zoološke zbirke. Obrađeni (determinirani, inventarirani i katalogizirani) dio mekušaca nalazi se zasada unutar 5 zbirki, a to su: Zbirka recentnih mekušaca Spiridiona Brusine, Zbirka mekušaca Ljudevita Rossija, Zbirka stranih mekušaca, Zbirka glavonožaca i Opća zbirka recentnih mekušaca.

Opća zbirka recentnih mekušaca HPM-a sadrži oko 120000 kopnenih i slatkovodnih mekušaca, uglavnom s područja Hrvatske, a manje iz susjednih zemalja. Nastala je sredinom prošlog stoljeća, a temelje joj je dao Spiridion Brusina (1845––1908). Nakon njegove smrti malakološki rad, punih 70 godina gotovo je zamro. Tako kronološki zbirku možemo podijeliti na stari dio (do 1977. god.) i novi dio (od 1977. god. do danas). Ovaj rad obrađuje stari dio zbirke koji broji 94027 primjeraka u 4815 inventarnih brojeva. Stari dio zbirke sadrži samo ljušture-kućice kopnenih i slatkovodnih puževa, koje čine 387 svojti (vrsta i podvrsta).

Najveći dio opće zbirke čine endemične vrste i podvrste mekušaca, koje su uglavnom pripadnice porodica Clausiliidae i Helicidae. Većina materijala u zbirci pripada nadzemnoj kopnenoj fauni, dok su slatkovodne, a pogotovo podzemne kopnene svojte izuzetno slabo zastupljene. Zbirka sadrži i tipove (holotipove, paratipove, lektotipove, paralektotipove, topotipove), a njihov će točan broj biti tek poznat nakon potpune znanstvene obrade zbirke.

Zbog svoje veličine i sadržaja, zbirka je izuzetno važan izvor za sistematska, taksonomska, zoogeografska istraživanja te istraživanja biodiverziteta mekušaca s područja Hrvatske. Nažalost, zbirka je neprikladno smještena u drvenim ormarima i epruvetama od običnog prozorskog stakla, izložena velikim temperaturnim promjenana, vlagi, i prašini i zahvaćena Byneovom bolešću (koja u krajnjoj fazi dovodi do pretvaranja ljuštura mekušaca u prah, tj. do potpunog uništenja malakološkog materijala u zbirci). Dosada nisu dobivena financijska sredstva za rješavanje tih problema opće zbirke recentnih mekušaca.